

A NEW SPECIES OF *SCHIZOTREMA* (CUMACEA: NANNASTACIDAE) FROM MORETON BAY, QUEENSLAND

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Both sexes of *Schizotrema nudum* sp. nov. are described and figured. It differs from other species of the genus in lacking spines on the carapace and on the dorsal surface of the abdomen. The species also differs from the closely related *S. leopardinum* Hale, in the relative lengths of exopod and endopod of the uropod. Eleven species are now known in this genus. Five (*S. aculeatum* Hale, *S. depressum* Calman, *S. leopardinum* Hale, *S. nudum* sp. nov. and *S. resimum* Hale) occur in Australian waters. □ *Crustacea, Cumacea, Nannastacidae, Australia, Schizotrema.*

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During a study of cumaceans in Moreton Bay, on the central east coast of Australia, a new species of *Schizotrema* Calman, 1911 was captured. The genus is one of 18 in the Nannastacidae. *Schizotrema* is differentiated from the closely related *Schizocuma* by the pseudorostrum which forms widely spaced inhalent siphons.

All specimens were taken using a sledge-mounted net of 500 µm mesh towed within 0.4m of the substratum at night. Although 700 samples were collected from 40 sites widely distributed within the Bay region only three specimens of the new species were taken, and all came from the same location. One specimen of *Schizotrema aculeatum* Hale, 1945, was also taken from the same location. A male and female of the new species were dissected, drawn and described and the other male used for S.E.M. study. Descriptions were carried out with reference to Felgenhauer (1992), Hale (1936, 1945, 1949), Jones (1963) and Watling (1989). In descriptions of appendages lateral refers to that margin of the appendage facing the lateral body surface and medial refers to that margin directed toward the midline of the body. Long plumose natatory setae on thoracic appendages have been truncated in some figures

SYSTEMATICS
Class CRUSTACEA
Subclass MALACOSTRACA
Superorder PERACARIDA
Order CUMACEA

Family NANNASTACIDAE
Schizotrema Calman, 1911

Schizotrema Calman, 1911:360; Stcbbing, 1913:165.

DIAGNOSIS. Anterolateral angle of carapace well developed; eyes divided into two separate groups; pseudorostrum forming two widely separated inhalent siphons; second to fifth pereionites well developed, usually with plate-like lateral extensions; no pleopods and no free telson.

Eleven species are now known in this genus. Five (*S. aculeatum* Hale, *S. depressum* Calman, *S. leopardinum* Hale, *S. nudum* sp. nov. and *S. resimum* Hale) occur in Australian waters and only *S. aculeatum* Hale and *S. nudum* sp. nov. are known from Moreton Bay.

KEY TO SPECIES OF *SCHIZOTREMA*
(Adapted from Hale 1949)

1. Carapace broad and depressed. Peduncle of uropod longer than telsonic somite *depressum* Calman
Carapace not or little depressed. Peduncle of uropod much shorter than telsonic somite 2
2. Exopod of uropod at least 0.3 times as long as endopod (not including terminal spines) 3
Exopod of uropod at most 0.25 times as long as endopod 9
3. Last pedigrous and first pleon somitic each with one pair of outstanding dorsal spines 4
Such somites with clumps of small spines or no spines 5
4. Spines on carapacc aculcate *aculeatum* Hale

- Spines on carapace spatulate . . . *sakaii* Gamo
- 5. Anterolateral angle of carapace produced as a stout cylindrical process 6
- Anterolateral angle of carapace not produced as a stout cylindrical process 7
- 6. Telsonic somite wider than long in dorsal view *bifrons* Calman
- Telsonic somite longer than wide in dorsal view *atlanticum* Bacescu & Muradian
- 7. Uropod with spine of exopod not quite reaching distal end of endopod (excluding terminal spine) *macrodactylus* Fage
- Uropod with spine of exopod clearly reaching beyond distal end of endopod (excluding terminal spine) 8
- 8. Surface of carapace with reticulate pattern of indentations; anterolateral corner of carapace angular and without spine *nudum* sp. nov.
- Surface of carapace for the most part smooth; anterolateral angle of carapace produced as a slender spine *sordidum* Calman
- 9. Carapace with dorsal and lateral spines *resimum* Hale
- Carapace not spiny 10
- 10. Carapace with mottled colour pattern, and with anterolateral angle broad, not at all down-bent *leopardinum* Hale
- Carapace without mottled colour pattern, and with anterolateral angle produced and strongly down-bent *bidens* Fage

Schizotrema nudum sp. nov.
(Figs 1-4)

MATERIAL EXAMINED. HOLOTYPE QMW20468, adult (S.L., 1.6 mm), perm. slide mount, Horseshoe Bay, Peel Island, 27°30'S, 153°22'E, site 31, D. Tafe, 17.6.1990, 2-3 m, sand, 34 p.p.t. salinity, 19°C water temperature. PARATYPES QMW20469, ovig. (S.L., 1.4mm), same data as holotype, perm. slide mount; QMW20470, adult (S.L., 1.7 mm), S.E.M. mount, site 34, otherwise same data as holotype.

DESCRIPTION OF MALE. Standard length 1.6 mm, (measured from anterior end of pseudo-rostrum to posterior end of telsonic somite, excluding spines and setae). Cuticle well calcified. Carapace with reticulate pattern of indentations; last three pedigerous and first three abdominal somites with paired dorsal nodules but without obvious spines (Fig. 1A, B). Carapace twice as long as combined length of exposed pedigerous somites, almost 1/3 total length of animal; posterior margin of carapace slightly raised dorsally, produced posteriorly to cover whole of first pedigerous somite and dorsum of second; anterolateral corner of carapace angular and

devoid of spines. Two prominent ocular regions located anteriorly on dorsolateral margins, each composed of 3 separate, hemispherical lenses (Fig. 1C, D).

Pleural parts of second to fifth pedigerous somites expanded (Fig. 1D); pleural region of second pedigerous somite almost as wide as carapace, 3-5 gradually decreasing in width; abdominal somites not expanded laterally. Dorsal region of telsonic somite flattened, approximately as wide as long, and longer than peduncles of uropods (Fig. 1E).

First antenna (Fig. 2A) with first segment of peduncle longer than second and third segments together, three large setae distolaterally, row of short, simple setae laterally; second segment with two large setae distolaterally, tubercle with one plumose and two simple setae distomedially; third segment subequal in length to second, bearing 1 simple and 2 plumose setae distomedially, and accessory flagellum distolaterally; accessory flagellum bearing 4-5 simple setae; main flagellum 3-segmented, first and second segments slender and subequal in length, third smaller, with 2 long, annulated aesthetascs terminally and 2-3 fine setae subterminally.

Second antenna (Fig. 2B) with 3 short proximal segments; fourth segment longer than combined 1-3. Third and fourth segments with lateral margins setose. Flagellum elongate, multiarticulate.

Mandible (Fig. 2C) molar process cylindrical with flattened masticating surface. Incisor with 3-4 teeth on inner edge; lacinia mobilis present on left mandible only; row of 5-6 closely spaced stiff setae on inner margin of mandible between distal teeth and molar process.

First maxilla (Fig. 2D) with 2 well developed terminal endites carrying at their distal ends a number of hamate setae; larger lobe with 7-9 setae, smaller 3-4 setae, with longest proximal, slender and pappose. Appendage with backwardly directed endopodite posteriorly; palp unilobed, with 2 long, slender setae, each with fine setules almost invisible at x400.

First maxilliped (Fig. 2E) basis with a row of slender simple setae medially and a hamate seta distomedially. Endopod 4-segmented; first segment short, with 3 setae distomedially; second segment rectangular with scattered setae; third segment shorter and narrower, with 3 strong distal setae one of which is long and serrulate, lateral margin of segment convex, with simple setae; fourth segment circular, with 2 fine subterminal setae.

Second maxilliped (Fig. 2F) basis subequal in

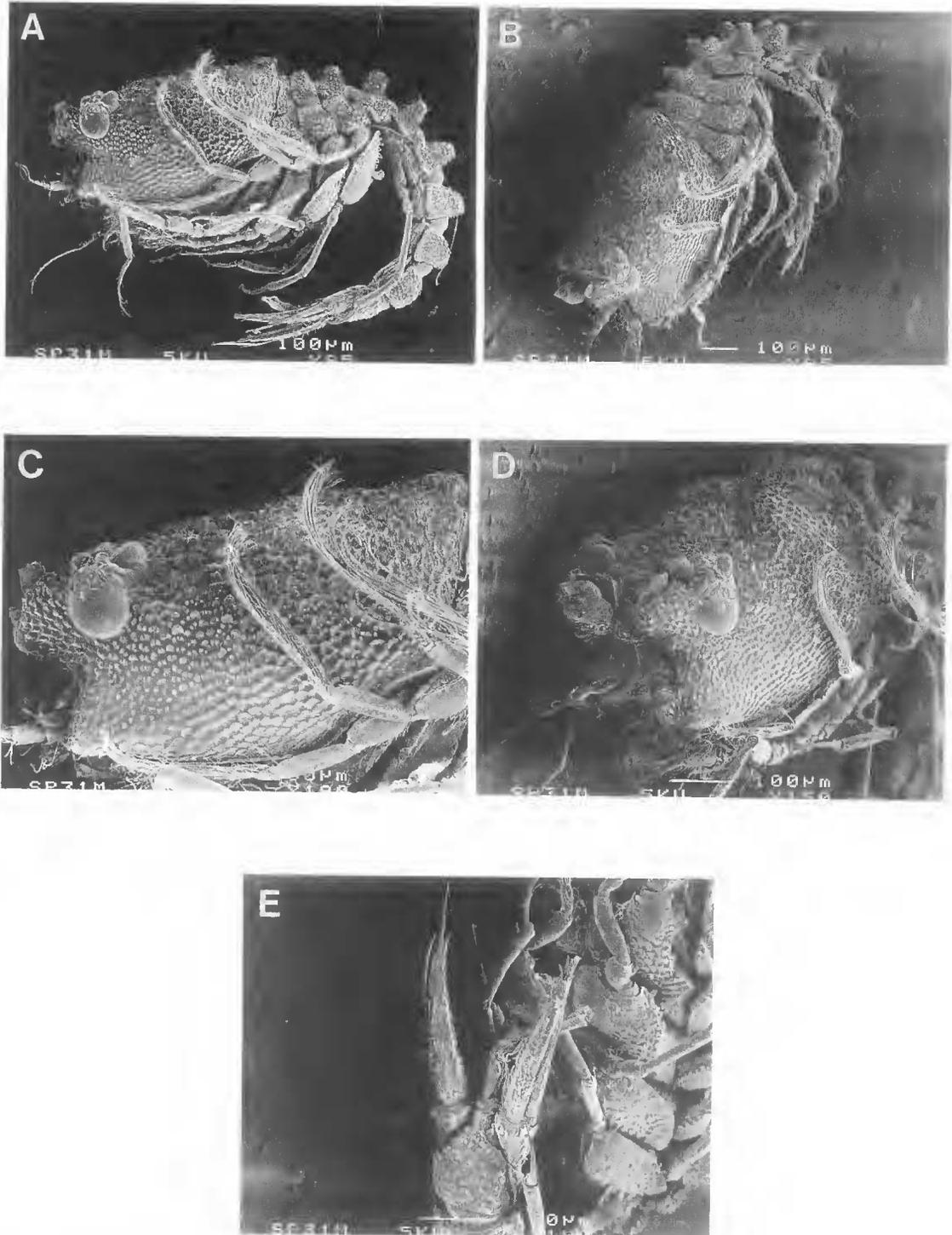


FIG. 1. *Schizotrema nudum* sp. nov., adult male. A, lateral view. B, dorsolateral view. C, carapace, lateral view. D, carapace, anterolateral view. E, telsonic somite and uropods, dorsal view. SEMs with JEOL 6400. Scale bars = 100 μ m

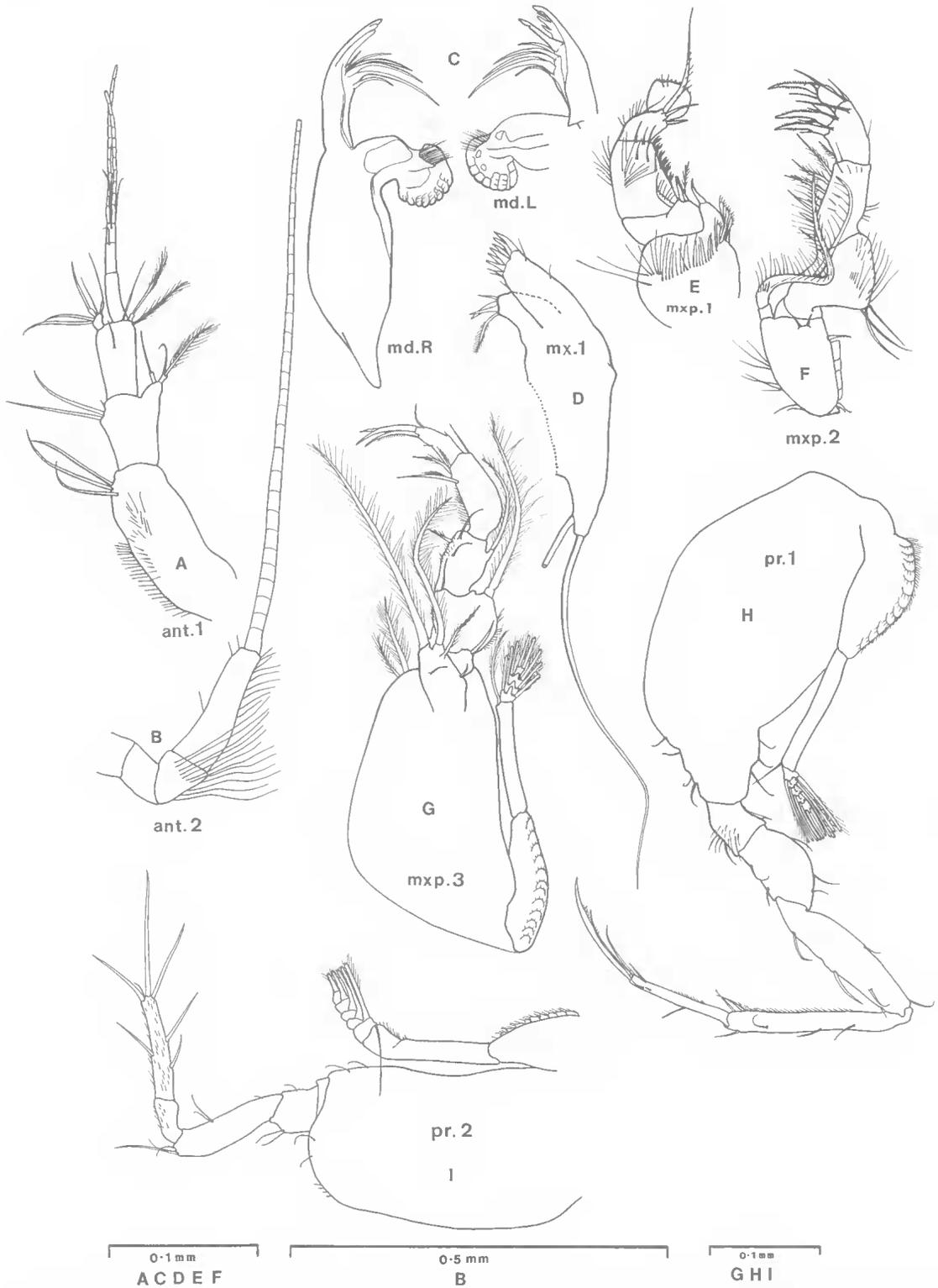


FIG. 2. *Schizotrema nudum* sp. nov., adult male. A, first antenna. B, second antenna. C, right mandible and portion of left mandible. D, first maxilla. E, first maxilliped. F, second maxilliped. G, third maxilliped. H, first pereiopod. I, second pereiopod.

length to merus, long, plumose seta distomedially, setae on medial margin and ridge on lateral margin; ischium extremely short, without setae; merus geniculate, expanded centrolaterally, prominence bearing several long setae distolaterally, single large plumose seta arising from the central anteromedial surface; carpus slightly shorter than merus, longer than propodus, with row of plumose setae along medial margin, scattered simple setae on lateral surface; propodus almost as wide as long, with 3 stout serrulate setae distally, with 3-4 slender setae subdistally; dactylus short with strong terminal seta.

Third maxilliped (Fig. 2G) basis inflated, subequal in length to rest of limb; laterodistal lobe with 2 stout and 1 fine plumose setae, two plumose setae on distomedial region of basis; ischium of endopod reduced, with simple seta distolaterally; merus broad with a stout, plumose seta distolaterally, row of short setae on convex lateral margin; carpus subequal in length to merus but narrower, long plumose seta laterally, scattered short setae distomedially; propodus longer than merus, carpus, and dactylus, simple seta distolaterally, 3 plumose setae distally; dactylus slender with 3 stout, curved terminal setae and 1 slender curved subterminal seta, 1 medial and 2 lateral simple setae. Exopod with basal segment bearing 12 ridges with microspines, following segment naked and elongate, 4 short distal segments each bearing 1 pair of long plumose setae.

First pereopod (Fig. 2H) with inflated basis and 5 endopod segments. Endopod longer than basis, terminal segments progressively longer from ischium to propodus, dactylus shorter than propodus and subequal in length to terminal seta; setae on all segments (except terminal seta) short and simple; propodus and dactylus with rows of fine setae on medial margins; terminal seta of dactylus slightly curved with setules on distal medial margin, 2 smaller terminal setae and 2 subterminal setae. Exopod with 2 basal segments of similar length, first broad and fringed laterally bearing 12 ridges with microspines; second naked and elongate; segments 3-7 reduced in length, each bearing a pair of long, plumose setae.

Second pereopod (Fig. 2I) basis inflated, as long as rest of limb. Endopodal ischium reduced; carpus subequal in length to dactylus, twice as long as merus and propodus; terminal dactylar seta straight and longer than segment, 2 shorter terminal setae, 1 lateral and 2 medial setae; surface of dactylus and propodus covered with microspines. Exopod with 2 subequal proximal segments, first bearing 12 ridges with

microspines laterally; segments 3-7 very reduced, each bearing a pair of long, plumose setae.

Third pereopod (Fig. 3A) endopod segments slender, together at least 1.5 times as long as inflated basis. Endopodal carpus longer than other segments, almost twice combined length of ischium and merus; dactylus arcuate, bearing 2 setae. Exopod with 2 subequal proximal segments, first bearing 10 ridges with microspines laterally; segments 3-7 very reduced, each bearing a pair of long, plumose setae.

Fourth pereopod (Fig. 3B) similar to third except terminal 5 segments of endopod together twice as long as inflated basis; exopod with 2 subequal proximal segments, first naked and second bearing 7 pairs of minute ridges with microspines; 4 reduced terminal segments each bearing a pair of long, plumose setae.

Fifth pereopod (Fig. 3C), with slender basis and terminal segments, without exopod. Carpus longer than other segments, 1.5 times length of propodus and twice combined length of ischium and merus; dactylus arcuate as with third and fourth pereopods.

Telsonic somite (Figs 1E, 3D) as wide as long, with 6 scattered setae on each side of the dorsum but without spines. Dorsal profile as figured.

Peduncle of uropod (Figs 1E, 3D) with lateral margin 0.6 times length of telsonic somite, 0.4 times length of endopod exclusive of its terminal spine. Exopod at least as long as peduncle and 0.45 length of endopod, with its long terminal seta reaching nearly to midlength of terminal endopod seta; 1 short distolateral terminal exopod seta. Terminal seta of endopod about half as long as ramus, with subterminal lateral setule; 2-3 short distomedial endopod setae. Medial margin of endopod serrate, with microspines.

DESCRIPTION OF FEMALE. Standard Length: 1.4 mm. Cuticle well calcified. Carapace and abdominal somites with reticulate pattern of indentations and paired dorsal nodules as in male.

First antenna (Fig. 3E) with first segment of peduncle longer than combined length of segments 2+3, 3 long setae distomedially, row of fine setae medially; second segment with 2 long setae distomedially, tubercle with 3 simple setae distolaterally; third segment subequal in length to second, with accessory flagellum bearing 3-4 setae; main flagellum 3-segmented with 2 annulated aesthetascs and 1 long seta mounted terminally; combined length longer than 3 segments of peduncle.

Mandible (Fig. 3F) molar process cylindrical with flattened masticating surface. Distal end with 4 teeth on inner edge; lacinia mobilis on left mandible only; row of 5 closely packed spines on inner margin of mandible between distal teeth and molar process.

First maxilla (Fig. 4A) with 2 well-developed terminal endites bearing several hamate setae; larger lobe with 8 distal setae and a subterminal seta laterally; smaller lobe with 4 distal setae, longest one proximal, slender and plumose. Posteriorly appendage with a backwardly directed endopodite; unilobed palp with 2 slender distal setae.

Second maxilla (Fig. 4B) with 3 lobes, all with setae along distal margins; largest, most distal lobe with 13-14 setae, longest one plumose; smaller inner lobe with 11-12 simple setae, outer lobe with 6-7 delicate, inwardly directed setae.

First maxilliped (Fig. 4C) basis with row of simple setae laterally and stout setae medially; endopod 4-segmented, first segment short, with one long plumose seta and 2 stout setae medially; second segment rectangular, with hamate setae medially and slender setae laterally; third segment narrow, with 3 strong distal setae, one long and plumose; lateral margin of third segment convex, with simple setae; fourth segment circular, with 2 fine subterminal setae.

Second maxilliped (Fig. 4D) basis longer than merus and ischium combined, long plumose seta distomedially; row of short setae medially and short simple seta distolaterally; ischium rudimentary and naked; merus geniculate, lateral margin convex, with several fine setae, single large plumose seta arising from the central anteromedial surface; carpus longer than merus and propodus, with 4 large plumose setae and numerous simple setae medially, row of simple setae midlaterally; propodus almost as wide as long, 3 strong, serrulate and 5-6 slender setae distally, directed medially, medial margin with rounded setuled lobe, 3 midlateral setae; dactylus slender, shorter than propodus, directed medially with strong terminal spine. Exopod with 5 long, plumose setae.

Third maxilliped (Fig. 4E) basis as long as next 3 segments combined, tubercle with 2 long plumose setae distolaterally, 2 plumose setae distomedially; ischium short with plumose seta distomedially; merus longer than ischium but shorter than carpus, plumose seta distolaterally and small simple seta distomedially; carpus shorter than propodus, plumose seta distolaterally, 3-4 small setae distomedially; propodus nar-

row proximally, lateral margin convex, three slender plumose setae distomedially, row of short setae on medial margin, 3-4 short setae on distal margin; dactylus slender, twice as long as wide, with 2 large curved terminal setae and 2-3 smaller subterminal setae. Exopod with 2 proximal segments subequal in length; 2 reduced terminal segments each bearing a pair of long plumose setae.

First pereopod (Fig. 4F) basis inflated; 5 slender endopod segments; ischium subequal in length to merus with 1 medial and 2 lateral setae; merus with 3 setae on convex lateral margin and 2 on medial margin; carpus twice length of merus with 2 lateral and 3 medial setae; propodus subequal in length to carpus and at least 1.5 times as long as dactylus, 4 setae laterally and 2 distomedially, row of fine setae along medial margin; dactylus slender, with curved terminal seta as long as dactylus, 2 shorter slender terminal setae and 2 subterminal setae. Exopod with 2 proximal segments subequal in length; 3 reduced terminal segments each bearing a pair of long plumose setae.

Second pereopod (Fig. 4G) basis inflated, longer than segments 1-4 of endopod, scattered simple setae only; ischium reduced and naked; merus longer than ischium and propodus but shorter than carpus and dactylus, 3 lateral and 2 medial setae; carpus subequal in length to dactylus, twice as long as propodus, 1 long and 2 short distolateral setae, row of fine lateral setae; propodus short with row of fine lateral setae; dactylus twice as long as propodus with major terminal seta straight and longer than segment, 2 shorter terminal setae, surface of dactylus covered with microspines. Exopod with 2 proximal segments subequal in length, 2 reduced terminal segments each bearing a pair of long, plumose setae.

Pereopods 3-5 (Fig. 4H-J) with slender basis and 5 slender endopod segments; dactylus arcuate with seta on inner margin; carpus longer than propodus and nearly twice as long as merus and ischium together; no exopod.

Telsonic somite (Fig. 4K) as wide as long, with 9-10 short setae on dorsal surface, with 2 slender setae distomedially.

Peduncle of uropod (Fig. 4K) with outer margin more than half as long as telsonic somite (0.65X) and half as long as endopod exclusive of its terminal seta, 1 slender distomedial seta; exopod shorter than peduncle and about 1/3 as long as endopod, with its stout terminal seta reaching beyond the distal end of endopod segment, 2

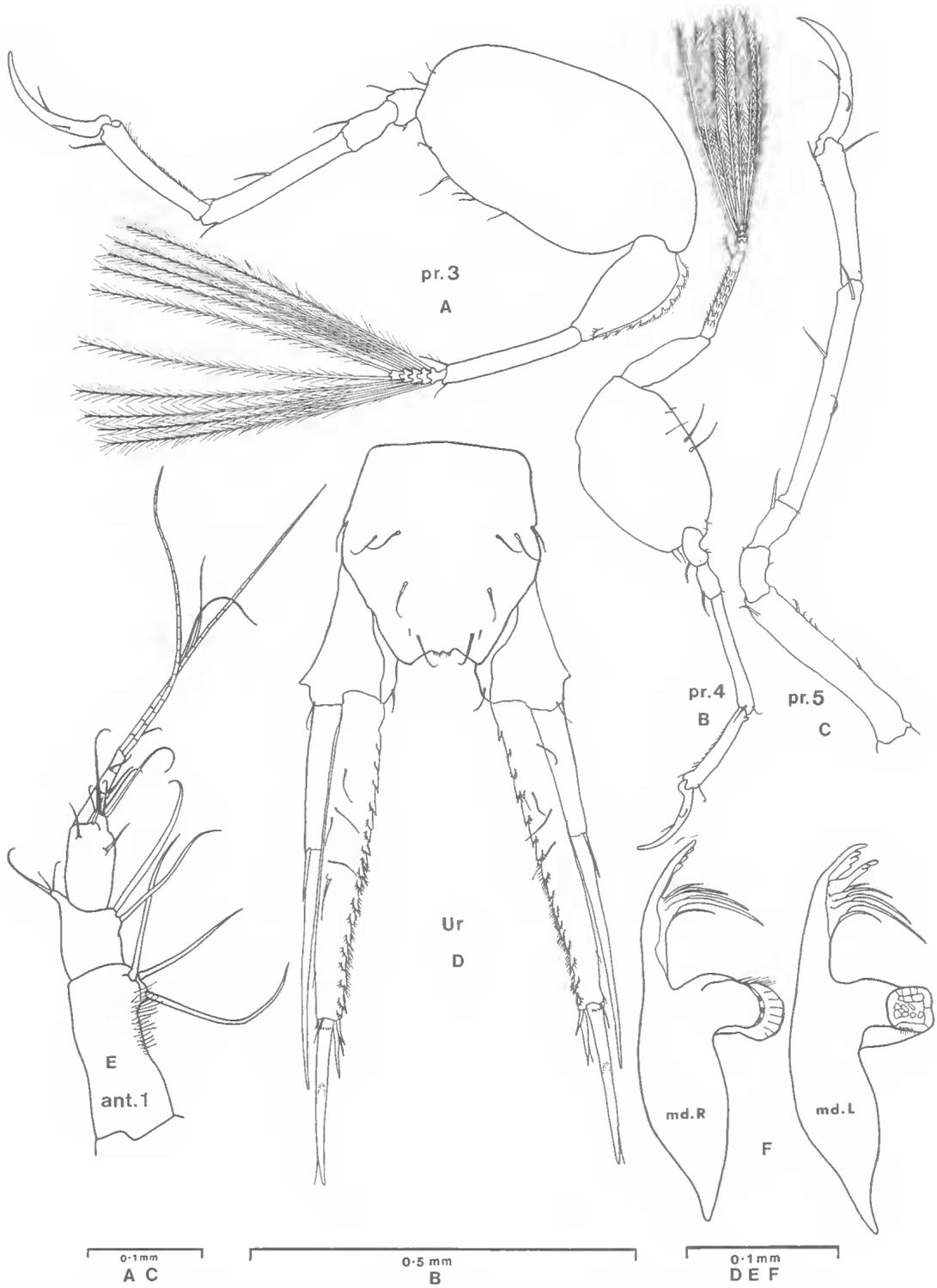


FIG. 3. *Schizotrema nudum* sp. nov. A-D, adult male. A, third pereiopod. B, fourth pereiopod. C, fifth pereiopod. D, telsonic somite and uropods. E, F, ovigerous female. E, first antenna. F, right and left mandibles.

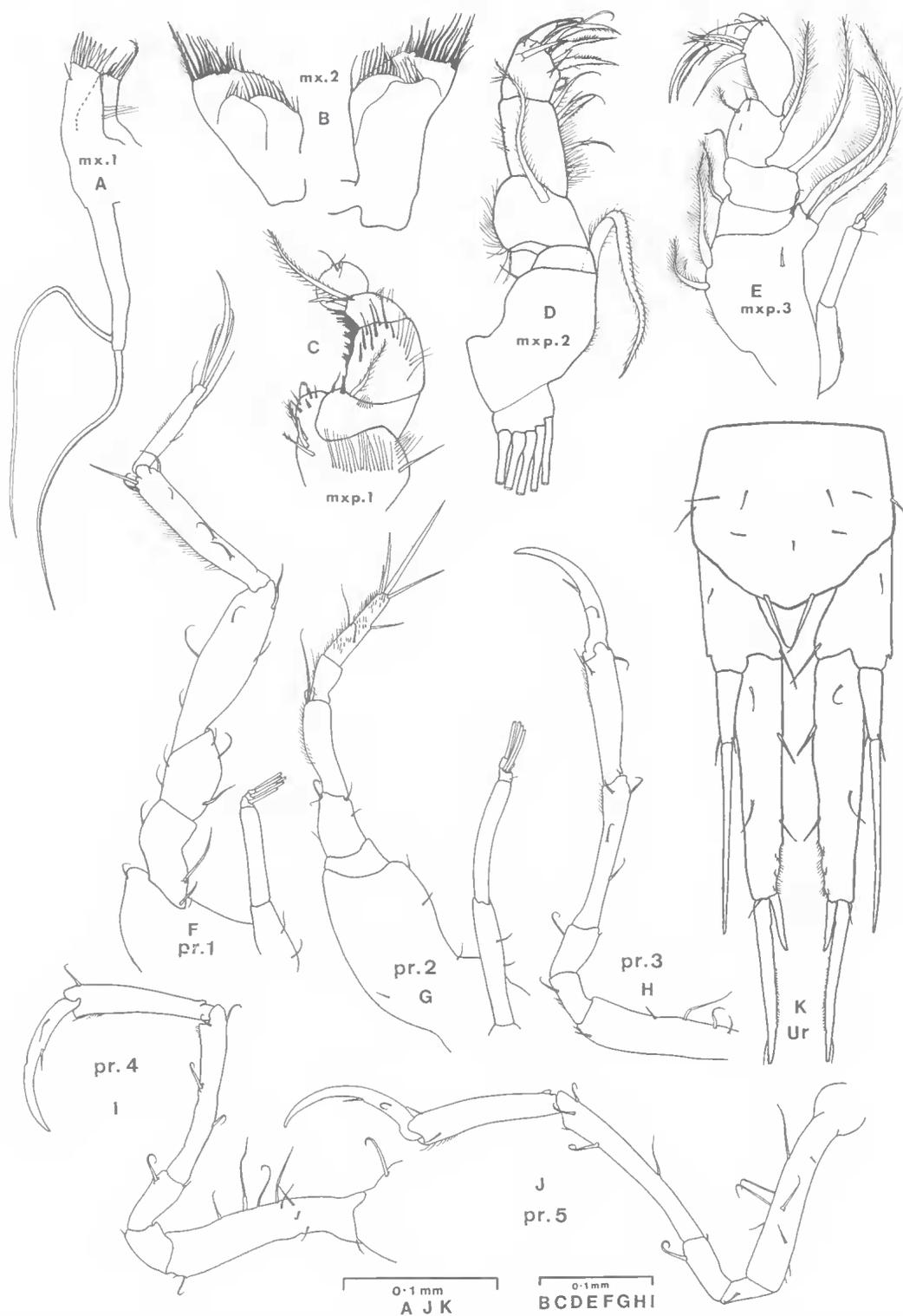


FIG. 4. *Schizotrema nudum* sp. nov., ovigerous female. A, first maxilla. B, second maxilla. C, first maxilliped. D, second maxilliped. E, third maxilliped. F, first pereiopod. G, second pereiopod. H, third pereiopod. I, fourth pereiopod. J, fifth pereiopod. K, telsonic somite and uropods.

small subterminal setae; endopod with 2 stout terminal setae, the outer one 2/3 as long as the ramus and 3 times as long as the inner one, bearing a long subterminal setule laterally and row of microspines medially, 1 fine terminal seta, 2 dorsolateral and 2 dorsomedial setae, and 3 distomedial ridges bearing microspines.

DISCUSSION. *Schizotrema nudum* sp. nov. is distinguished within the genus by its lack of spines on the general surface of carapace and abdomen, and by the paired nodules on the dorsal surfaces of most free somites of the pereon and pleon. The uropods also distinguish *S. nudum* from other Australian species. *Schizotrema nudum* is distinguished from *S. aculeatum*, *S. bifrons* and *S. sakai* which have on spination alone. The latter three species have characteristic spines on the carapace and free somites. Specimens of *S. aculeatum* were also taken at night in Horseshoe Bay.

Like *S. nudum*, *S. leopardinum* is completely devoid of stout spines on the cuticle. However, the relative proportions of the rami of the uropod enable the two species to be easily distinguished. The female of *S. leopardinum* has not been described but the male uropod has an exopod only 0.25x the length of the endopod, compared to 0.45x in *S. nudum*. Also the differences in colour and surface texture make the two species readily distinguishable. The bold pigment patches of *S. leopardinum* persist even in spirit preserved material (Hale, 1949).

Schizotrema resinum is distinguished from *S. nudum* by its smaller size, conspicuous body spination and very small exopod on the uropod. The dorsum of its carapace exhibits rather large spines, many of which bear a brush of minute setae distally.

Schizotrema depressum exhibits a broad, depressed carapace which distinguishes it from *S. nudum* and all other members of the genus (Hale, 1949).

The new species was compared with type material of *S. aculeatum* and *S. leopardinum*, and non-type material of *S. depressum*, all in the South Australian Museum.

ETYMOLOGY. Latin *nudum* naked; referring to the lack of conspicuous body spines and striking colour patterns.

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